

One Man's GOVERNANCE PERSPECTIVE

- Local Issues
- Regional Management
- 19 Recommendations

Prepared by Steve Perrin
Member of the Governance Working Group
steveperrin@verizon.net



Friends of Taunton Bay

May 2006

One Man's Governance Perspective

CONTENTS

A note on process—1

Introduction—2

SECTION A—4

Using Ecosystem-Based Management to Frame Issues in Taunton Bay—4

A mosaic of habitats—5

Shifting baselines (Part 1)—6

Ecosystem-based management (Part 1)—9

Management issues—10

Regional coastal management (Part 1)—12

SECTION B—14

Regional Management—14

The problem—14

The solution—14

Agency structure—15

Public-trust management—17

Ecosystem-based management (Part 2)—18

Rich information—19

Shifting baselines (Part 2)—20

Integrated management—21

Regional coastal management (Part 2)—21

Regional enforcement—22

Recommendations or decisions?—23

Education—23

Conflict resolution—24

Volunteer workforce—25

Regional staffing—25

Who pays?—25

Coordination & alliances—27

Regional management template—27

Principles—28

The unthinkable—29

SECTION C—30

Recommendations—30

References—32

Financial assistance provided by the Coastal Zone Management Act of 1972, as amended.
Administered by the Office of Ocean and Coastal Resource Management,
National Oceanic and Atmospheric Administration.

The Taunton Bay Study • One Man's Governance Perspective
LOCAL ISSUES • REGIONAL MANAGEMENT • RECOMMENDATIONS

Steve Perrin, a member of the Governance Working Group
steveperrin@verizon.net

A note about group process and the contents of this chapter: Members of the Governance Working Group of The Taunton Bay Study met 16 times in various configurations between February 4, 2005, and April 14, 2006. The four principles on page 30 of this report together with their corollaries as agreed to on March 23rd, 2006, are the distillation of those fifteen months of work. The principles are the only products of this subcommittee developed by consensus. The governance group also discussed a variety of suggested improvements for nearshore governance. In general two categories of approaches were amenable to all members of the group – 1) those not requiring a change in current authorities (adoption of overarching principles, development of a structure for collecting, analyzing and communicating data, and development of a structure for engaging local citizens in planning, and development of a structure for increasing communication among decision-making agencies); and 2) methods requiring changes in Maine's current governance structure (formation of regional management councils, development of regional management plans as governing documents for regulatory decisions and development of mechanisms for coordination of municipal land use regulation and state natural resource regulation) . Due to limited time remaining in the pilot project, a detailed narrative of the above points was not developed as a final product of the study. Aside from the principles on page 30, the narrative in this section and the nineteen recommendations offered are the work of one member of the group, Steve Perrin, and thus this chapter of the report is entitled, "One Man's Governance Perspective". Steve's work was presented for review and discussion to the entire governance committee, with two members amenable to inclusion of Steve's ideas as the final report submittal and two members not in favor of this approach.

Introduction

The work of the Governance Working Group has been anchored to three documents: 1) The pilot project RFP, 2) the FTB project proposal, and 3) the SPO-FTB contract setting forth project deliverables. These three documents have guided us through a project that has been challenging, thought-provoking, and in the end, rewarding. Key sections of the documents include:

The RFP: The objective of these pilot projects is for a qualified local or regional entity to actively explore improvement of resource management and resolution of use conflicts in its area by bringing together various sources of information and perspectives of interested citizens. Pilot projects must include a range of stakeholders, appropriate to the scope and scale of the project, in issue identification, development of recommendations for resource allocation and siting, and resolution of user conflicts.

The FTB Proposal: The Taunton Bay proposal translates the RFP's stated objectives of: 1) improving marine resource management in Maine, 2) resolving conflicts between users, and 3) bringing new information and a diversity of perspectives to bear on bay management issues into five areas of activity." The Governance area is "to propose ways of incorporating local ecosystem information into a revised bay management structure agreeable to a majority of user groups. Throughout, the Taunton Bay pilot project places primary emphasis on the sustainable health and integrity of the watershed-ecosystem continuum.

The Contract: Task 6. Decision-making structure: develop and compare various models of effective bay management involving state and local agencies/groups in different configurations; refine and propose the design thought to work best under circumstances in the Taunton Bay region; assess state, local, and volunteer capacity necessary to make an ecosystem-based bay management plan work in actual day-to-day practice.

DELIVERABLES:

a) A governance report including:

- A proposed method for using local information in state-level and other decision-making processes
- Assessment of the local and volunteer capacity necessary to carry this work forward in Taunton Bay
- Assessment of considered and proposed changes to governance structure.

On April 18, 2005, Caroline Pryor, then leader of the Governance Working Group (she subsequently stepped down when project funds covering her consultant fee ran out), drew up a scope of work for the group. The document listed specific tasks for the group as follows:

- Research bay management principles and models from other regions
- Compare various models of effective bay management involving state and local agencies in different configurations
- Refine and propose the design thought to work best under circumstances in the Taunton Bay region, with input from stakeholders
- Assess state, local, and volunteer capacity necessary to make an ecosystem-based bay management plan work in actual day-to-day-practice.

She cited the three deliverables listed above, and concluded:

In addition, the Governance Committee intends to develop and propose:

- A set of management principles for Bay Management Plans
- An outline of what a Management Plan for Taunton Bay would look like.

In hindsight, that is a very ambitious program for an all-volunteer organization in a watershed with only some 1,600 year-round residents, and for the Governance Working Group, namely:

Frank Dorsey, Vice-President, Friends of Taunton Bay
Roger Fleming, Attorney, Conservation Law Foundation
Lee Hudson, Frenchman Bay Fisheries
Vanessa Levesque, NOAA Fellow, Maine State Planning Office
Steve Perrin, President, Friends of Taunton Bay
Caroline Pryor, independent consultant
Barb Welch, Executive Director, Frenchman Bay Conservancy

When Roger or Vanessa were unable to attend group meetings in person, they often took part in discussions by speakerphone.

As it turned out, the thread binding the group's different activities proved to be the task of coming up with a set of guiding principles for bay management, which in various drafts ran through every meeting from the first to the last. Everything the group did was tied to those principles, which evolved from a CLF intern's list of five "classic elements of coastal management" introduced at the first meeting, through monthly drafts containing as many as fourteen different principles, to the set of four basic principles approved unanimously by the Governance Working Group on March 23, 2005 (*included on page 28*). That final set contains echoes of the five classic elements we started out with twelve months before.

The classic elements are: 1) adaptive management, 2) interdisciplinary integration, 3) community-based initiatives and capacity building, 4) proactive management, and 5) ecosystem-based management. Thus began the project's crash course in coastal management, which set us thinking about ways to improve use management in our region by incorporating sound local information into the decision-making process. Particularly striking were management efforts in Australia that nested several levels of management—local, regional, state—within a single coherent system, the different levels united in assuming a shared advocacy for the coast. In a separate report, Roger Fleming is providing a draft summary of the coastal management models we have considered.

The Governance Working Group collaborated with the Outreach Working Group in planning a Taunton Bay stakeholders meeting held on July 27, 2005, and a meeting with state agency personnel held in Augusta on September 1, 2005. Three members of the group spoke at the Bay Management Steering Committee Workshop in Belfast on February 17. In April and May 2006, three meetings were held to gain input regarding regional management from other local groups.

SECTION A

Using Ecosystem-Based Management To Frame Issues in Taunton Bay

- Pollution from runoff, growth/land development, and habitat loss were consistently rated as top priorities and concerns for the region as it considers Taunton Bay issues. Development was the issue most often rated to be at levels that are too high. Pollution regulations and their enforcement and scientific research were the activities respondents most frequently rated to be too low.
- Respondents overwhelmingly believed that Taunton Bay should remain closed to dragging. Some believed it should remain closed under all conditions, while others expressed that the ban on dragging should only be maintained if the results of research demonstrate that dragging activities have significant negative impacts on habitat, marine life, or other fishing practices in the bay, such as clamming or worming.
- Notably, most respondents repeatedly expressed support for aquaculture-related activities in Taunton Bay, including shellfish aquaculture leases and the proposed USDA aquaculture facility.
- This survey suggests that information about trends in marine populations represents the greatest knowledge gap, followed by information about the specific impacts of fishing activities and aquaculture in Taunton Bay.

Tracy Hart, *Needs and Issues in the Taunton Bay Region: A Survey of Residents from Franklin, Hancock, and Sullivan, Maine*. (Orono, ME: Maine Sea Grant Program, 2003. Conclusions, pages 22–23.)

Between April 20 and November 12, 2005, I made 79 trips on the bay to monitor indicators of bay health and integrity for The Taunton Bay Study. Indicators included two sub-populations of horseshoe crabs, harbor seals, phytoplankton, water transparency, bank erosion, benthic temperature, vegetated buffer strips, oyster set, shorebirds, salinity, and invasive species. Having recently completed a 60-page report on the results of that activity, I believe it is now time to ask, 1) What have we learned from this work? And more pointedly, 2) What are the management implications for Taunton Bay?

Consider the historical setting in which that first question is asked.

- The Taunton Bay Assessment points out that by the late 1990s, urchins and scallops had been fished to commercial extinction in the bay by a combination of excessive dragging and dive harvesting (DMR 2004).
- Mike Briggs, Taunton Bay oyster farmer and a former seafood dealer for twenty years, remembers the days when Hog Bay mudflats contained 100 mature clams per square foot, and a single rake would bring up thirty clams (personal communication).
- Twenty mudflat samples taken for The Taunton Bay Study in October 2005 contained no mature clams, no blood worms, and only juvenile clam worms (see Indicators Monitoring Report: Benthic Invertebrates).
- At scoping sessions and mussel aquaculture lease hearings held in 2005 for operations in upper Frenchman Bay, it was stated that wild mussel draggers had scoured the once mussel-rich Mount Desert Narrows area free of native blue mussels and almost all eelgrass.

- With mussel beds in upper Frenchman Bay now largely depleted, aquaculturists are looking to Taunton Bay as a source of seed (mussels under 2 inches long) for their grow-out operations in Frenchman Bay.
- Seth Barker of DMR has reported that between 1996 and 2001, Taunton Bay lost 90% of its eelgrass, one of its most significant primary producers and provider of protective habitat to many marine species.
- Winter flounders have disappeared from the bay, and flocks of thousands of migratory shorebirds have dwindled to a few birds scattered here and there.

In the meantime, what *has* grown is the human population and its development of shorelands around Taunton Bay. In the 1940s and 1950s, most settlement activity was along roadways some distance from the shore. The bay was largely seen as a backwater with little deep-water anchorage, so shorefront developers looked elsewhere for lots. But slowly in the 1960s and 1970s, and at a quicker pace in the 1980s and 1990s, Taunton Bay caught on as a site for vacation and retirement homes at a reasonable price.

By looking at the bay and its watershed as an ecological whole, the first thing we have learned is that Maine's management of many of its public-trust resources hasn't worked very well. Harvesters may have reaped some short-term benefits, but at the expense of the bay's long-term vitality. Though natural systems operate in a climate of perpetual change, the collective downward spiral of so many parts of the system at one time is a warning sign that Taunton Bay as a self-regulating and self-regenerating system is in crisis largely because of the pressures placed on it by a combination of shoreland development and excess harvesting of natural resources.

A mosaic of habitats

As a result of my reading up on ecosystem-based management, and my personal monitoring efforts in 2005, I now see Taunton Bay very differently than I did before undertaking that commitment. For me, now, it is a mosaic of different habitat regions tied together by the seven-mile channel running through it from Tidal Falls to Hog Bay. *Taunton River* is a region unto itself, with fast-moving currents, kelp beds, cold waters, and a wide diversity of species including lobsters, crabs, horse mussels, brittle stars, barnacles, cormorants, loons, and harbor seals. Bank erosion is very evident on the Hancock shore of the river where sandy glacial deposits are washed by the tides twice each day. The river is anchored at its mouth by *Tidal Falls*, in itself a special habitat region that aerates tidal waters rushing over a ten-foot sill, offering rich habitat to a wide variety of marine life. A mile upstream, the river opens onto the broad sweep of Taunton Bay. Here the *channel* divides into two branches, the minor branch heading northwest past Burying Island Ledge toward Egypt Bay, while the major branch sweeps north around Burying Island toward the upper bay where it bends around Hatch Point to head toward Hog Bay and the largest saltmarsh in the vicinity. This easterly channel is still scoured by fast moving water, which sweeps sediment farther into the bay, exposing a channel bed of pebbles and gravel where, till the late 1990s, scallops were plentiful.

In addition to the branching channels above Taunton River, three other regions become evident, *mussel reefs* (shoals, beds, bars) lining the upper slopes of the channels, with extensive *subtidal flats* stretching between the channel and the shore, near which they grade into *intertidal flats*. At

high tide, Taunton Bay gives the impression of a deep basin, but its true nature is revealed between mid and low tide when waves drag across a muddy bottom, the water becomes turbid, and propellers are apt to run afoul of eelgrass, uncharted boulders, or Taunton Bay mud. There is abundant life here, too, notably clams, worms, sand dollars, sea stars, whelks, moon snails, mussels, along with myriad microbes and plankton too small to see. Harbor seals often cruise in the channel, with sometimes an otter or mink close to shore.

Mussel reefs form on the brink of the channel where both sediments and nutrients well onto the flats on an incoming tide. Blue mussels not only thrive on the upwelling nutrients, but serve to slow the current, allowing sediment to settle out of the water column, slowly building a natural levee that armors the edge of the flats where they are most vulnerable to scouring by strong currents and winter ice. These reefs are vital in filtering both mineral and organic particles out of the water, allowing the bay to cleanse itself for extended periods twice a day. Mussels reject large food particles that tend to clog their filter-feeding organs, contributing to a layer of pseudo-feces that aren't feces at all but food for the many benthic invertebrates that share their reef habitats. When shellfish aquaculture operations are proposed for an area, improved water quality is always cited as a prominent benefit; but when mussels are to be removed by dragging or hand-harvesting, the resulting decline in water quality is seldom mentioned. Mussel reefs play important structural and ecological functions in Taunton Bay. They are not here by accident, but are vital organs that contribute to the day-to-day functioning and integrity of the bay as a natural system. The cooperative FTB-DMR horseshoe crab tracking project of 2003–2005 showed that many horseshoe crabs burrow into the upper channel slopes from November through late April, where they are dependent on the rich food supply available to them upon their becoming active again in the spring after lying dormant for six months.

With its thousands of acres of river and channel habitats, reefs, subtidal and intertidal flats, as well as a reversing falls at the estuary mouth and salt marshes at the head of the bay, Taunton Bay is a living system in which all areas work together to maintain the overall health and integrity of the region as a whole. That is the big picture that emerges from monitoring a variety of indicators day-by-day for an extended period. The view over the bay from a picture window is not the resource; the clam, worm, or scallop is not the resource; nor the eel, alewife, or smelt. The true coastal resource is the bay as an entire energy system made up of these myriad parts working together for the benefit of all. It is the nature of such systems to respond to the changing conditions acting upon them by balancing their various parts and interactions so as to sustain their dynamic integrity, which, once lost, leads to the collapse of the system itself.

Shifting baselines (Part 1)

The Taunton Bay Study was conducted largely in 2005. What if it had been conducted in 1980, 1955, 1905, or even 1805? At other times we might have found (or not) thriving fields of eelgrass, flats fat with clams and worms, or shores devoted largely to quarrying, mining, farming and shipbuilding. The danger with baseline studies is in assuming that all that has gone before is irrelevant because we lack accurate data with which to describe bygone days. What we discover today is taken as normal, and future expectations are based on that questionable assumption. But are we to accept a nearly clam-less, scallop-less, urchin-less, eelgrass-less Taunton Bay as “normal”? Is this the way it should be? That would be a misreading of the limited evidence we have available to us, and a much depleted legacy to pass on to future generations.

After a year of intense activity, what does The Taunton Bay Study really tell us? The indicators share of that work addresses the following issues:

- *Horseshoe crabs* still live in Hog and Egypt Bays at the northernmost limit of their global range, but we don't really know if their numbers are up or down over the ten-, hundred-, or thousand-year term. We do know that these two sub-populations are of local, state, national, and global significance.
- *Harbor seals* seem to be holding their own in the bay, reproducing year after year, but we have to assume their fat contains the same high concentration of toxic chemicals found in other populations along the coast, so we can make no statement about the health and well-being of this particular group.
- *American bald eagles* had a poor year in 2005, only one pair out of five successfully producing a fledgling, but overall they seem to have recovered from their trial by DDT, apparently tolerating a certain concentration of pesticide residue.
- *Shorebird* numbers are a small fraction of the migratory flocks that stopped over on the bay's flats in the 1980s to refuel on mud shrimp (*Corophium volutator*) before flying nonstop to the Caribbean. That sharp decline may result from the general depletion of life on the flats and inadvertent disruption of mudflat ecology.
- *Eelgrass* has yet to rebound after its dieback in 2001. A few beds persist in colder waters of the bay, but flats in Egypt Bay and off Hatch Point remain sparsely covered in comparison to photographs showing eelgrass coverage 1996–2000.
- *Benthic invertebrates* (shellfish, worms, etc.) in Hog Bay are depleted in size and numbers, but no sound conclusions as to why can be drawn from the twenty samples taken in 2005. Anecdotal evidence points to a marked decline in both clams and worms, but intense harvesting efforts manage to sustain the annual take at a high level. FTB has received funding to conduct a pilot project in habitat-based management of mudflats, which will focus on ways to restore productivity.
- *Weather* (temperature, precipitation, windspeed) monitoring in 2005 provides evidence that unpredictability is the norm, but the trend seems to be toward more unsettled weather with stronger winds, more rain, and warmer temperatures. 2005 was notable for six weeks of cold onshore winds off the Gulf of Maine in April and May which delayed ecosystem recovery after winter well past the traditional coming of spring.
- *Bottom temperatures* in Egypt and Hog Bays showed that water temperature tracks mean air temperatures with a lag of a few days, demonstrating that if global warming is real in the air, it will be equally real in the bay as well, with consequences that cannot be fully appreciated until they arrive (they may already be here). The shallow subtidal and intertidal flats which characterize Taunton Bay will bear the initial brunt of climate change because they are already stressed by extreme ranges of temperature and salinity on a daily basis. As go Taunton Bay and other estuaries in this regard, so the rest of the coast is likely to follow.
- *Coliform counts* in 2005 are generally lower than in recent years, but this may be an artifact of a sampling frequency that might have missed major runoff events in the second wettest out of the past 110 years. One sampling site, for example, was visited only two times during the monitoring season, another only four. Most sites were visited twice in April, and once each in June, August, September, and November. The fact remains that high bacteria counts have led to eight flats remaining closed throughout 2005.
- *Phytoplankton*, microscopic food producers that thrive in the sunlit regions of the world's oceans, are a significant food source for zooplankton (minute animals) in the water column,

which are eaten in turn by a great variety of marine life. Few toxic species were found in the twenty-seven samples taken from the bay in 2005, and no *Alexandrium*, blooms of which can cause shellfish poisoning. FTB has been monitoring phytoplankton since 2002.

- *Bank erosion* was pronounced in 2005, a result of wave action, high tides, and accelerating sea-level rise. Throughout the twentieth century, sea level rose 0.038 inch a year, for a total of 3.8 inches in 100 years. That rate has now tripled to a rise of over 0.12 inch a year, or 12.0 inches a century. Melting of the Antarctic ice shelf will show up in Taunton Bay as a rise of 20 feet above current tide levels. Melting of Greenland ice will add another 20 feet.

- *Buffers of native vegetation* around the shore absorb runoff, together with the pollution burden it carries off the land. Coastal watershed development increases land clearing, impervious surfaces that promote runoff, and the potential for coastal pollution. As more and more water views are sold and developed, pollution becomes a growing reality all around the bay. This can be mitigated by leaving a pollution-absorbing buffer of native plants requiring no fertilizers, herbicides, or pesticides between construction sites and the bay. Lawns, which encourage runoff, do not generally serve as such buffers.

- *Septic fields* are designed to spread nutrients (look where the best raspberries grow), but not as far as coastal waters. When household chemicals poured down the drain prevent hardworking bacteria from performing their intended function of breaking down waste, that waste is apt to leach into the soil, where it goes with the downward flow of water toward the bay. By definition, the entire watershed of Taunton Bay drains to the one bay, so the collective impact of that drainage grows along with every new house and septic field installed in the watershed. As the watershed is developed, the bay is put at greater risk. Which is why septic systems need to be kept in top condition.

- *Invasive species* are inevitable. Think of red clover, lupine, rugosa roses, and green crabs as familiar examples. And now Asian shore crabs, first found on Cape Cod in 1992, then on Isle au Haut in 2004, and now Schoodic Peninsula in 2005. Without natural predators waiting in welcome, invasives are apt to thrive in the habitats they adopt. Asian shore crabs eat small clams even faster than green crabs do, so they pose a potential threat to any attempts to restore clam flats in the bay to their native productivity.

- *Oyster set* on local boulders would indicate that farmed Eastern oysters are reproducing in Taunton Bay—with consequences that can only be imagined, but monitoring indicates that has not happened, and is not likely to happen now that the oyster grow-out lease site is being moved from the upper bay to colder waters in the channel south of Burying Island.

- Lauren Alnwick-Pfund's *ecohistory narrative* is based on interviews with thirty-three long-time residents of the bay region. She found that most people do not identify with the region as much as earlier residents might have, so it is harder to get them involved in bay issues and concerns. She also found that many residents are aware of changes over the years, but, too, many believe biological systems operate on a cyclical basis, so have faith in the capacity of the bay to restore itself over time.

The point of all this monitoring being that the bay is not some generic coastal habitat, but home to individual members of particular species of marine life throughout the year, some unseen in the channel, some evident in shallows or on the flats, some on the shore, others in the maritime woods ringing the bay, including humans who come and go with the seasons. I knew all that before I undertook the monitoring of indicators of bay health and integrity. But the monitoring enabled me to describe the bay more accurately as a definite place along the coast. Not just *any*

place but *this* place in particular that we know as Taunton Bay.

Ecosystem-based management (Part 1)

Does this new information have a potential for supporting better, ecosystem-based, coastal management decisions (“better” in being tailored to these waters by local concerns and information)? After all, the promise of improved decisions was the primary reason Friends of Taunton Bay undertook The Taunton Bay Study in the first place. A year later, does our experience lend support to that view?

The Taunton Bay Study has been guided from the start by the insight that short-term management is generally unsuccessful because it omits long-term consequences to the ecosystems that support all human uses of coastal waters. Similarly, single-use (or single-species) management doesn't work because it does not consider consequences to other species and the habitats they share within those larger ecosystems. To improve coastal management, there is no getting around taking a broader and longer-term view so that management policies and decisions are applied in the fundamental, real-world context of coastal ecosystems embracing both watersheds and marine receiving waters alike. Ecosystem-based management avoids the weaknesses of the various forms of single-use and single-species management that have become traditional along the Maine coast.

What, then, is ecosystem-based management? It does not imply that humans will henceforth undertake on their own the management of land and water ecosystems. It is based on a good understanding of such ecosystems, but management is directed at the uses humans make of them rather than at the ecosystems themselves. The goal here is to avoid inadvertent disruption of natural systems which we can never fully understand. This sidesteps the notion that modern technological man can identify all the parts of coastal ecosystems, and grasp the complex interactions that take place between them. We are wiser to leave those intricate details to the ecosystems themselves, which have an excellent record of managing their own affairs for thousands of years.

The thrust of ecosystem-based management, like that of the Hippocratic oath, is to do no harm. In other words, if you can't make it, don't break it. Who among us can make an oak, a clam, or a cod? What we can do is train ourselves to respect our own limitations, and act accordingly. Ecosystem-based management recognizes the flow of solar energy from primary food producers (such as eelgrass, rockweed, kelp, coastal marshes, mudflats, and phytoplankton) to plant-eating animals, animals that eat those animals, on to the decomposers that recycle nutrients and organic molecules, making them available once again to the system at large.

Too, ecosystem-based management recognizes the complex makeup of single-species populations, including different age classes, sexes, preferred habitats, prey, predators, life stages, behaviors, and other single-species characteristics. It also recognizes that every species lives in the company of many other species, with which it engages in unceasing interaction, each affecting the others and being affected in turn.

Habitats are a key component of ecosystem-based understanding, so that when people enter an ecosystem, they watch for the specific places which their uses affect, so they can guard against

interfering with the protective, food-productive, or social functions those places provide their native inhabitants.

Lastly, ecosystem-based management respects the variable conditions that drive ecosystem functioning (such as precipitation, temperature, wind, currents, nutrient availability, turbidity, pollution, salinity, sunlight, among other factors) and learns to anticipate the stresses and effects that changes will likely have on different parts of local systems as a whole.

In Taunton Bay, ecosystem-based management begins with recognition of functional subregions within the bay (the previously mentioned channels, reefs, subtidal flats, intertidal flats, marshlands, reversing falls, tidal rivers, and so on). This leads to study of the various habitats within these regions, the plants and animals that rely on them for support during various stages of their lives, and the interactions among those plants and animals. It is against this background of ecosystem understanding that ecosystem-based management can prove more effective than earlier management schemes which have largely overlooked many of the consequences human activities have had on marine and watershed systems.

Management issues

Within each subregion of the bay, specific issues will arise that need management attention. In Taunton Bay, *mussel dragging* is such an issue because it would have immediate impacts on the structure and function of the reefs where it is proposed. The question is, would it harm or impair that structure or that function? *Turbidity* is another issue because in varying degrees it blocks sunlight from reaching the primary food producers on which all life in the ecosystem depends. The land-based aquaculture facilities at UM's Center for Cooperative Aquaculture Research in Franklin has installed three settling tanks to allow sediment to be removed from its intake stream. Just as surely as Taunton Bay is characterized by subtidal and intertidal mudflats, the mud on those flats moves around on tidal and wind-driven currents. Muddy coves and waters testify to the bay's burden of suspended particles. Managing human uses of the bay to minimize that burden would be one task facing managers in basing their decisions on ecosystem considerations.

Which highlights the need for *accurate, up-to-date information* as a basis for effective management decisions. Local monitoring efforts throughout every region of the coast would provide the essential foundation on which an improved coastal management structure could be built. The mapping and indicators monitoring efforts of the Taunton Bay Study provide examples of what that foundation might look like in a particular locale.

Another issue in Taunton Bay is *habitat management*. Particularly the complex interactions between worms, wormers, clams, clammers, shorebirds, horseshoe crabs, flounders, and others who use and benefit from the high productivity of local subtidal and intertidal flats. As it is now, the flats are regulated by being harvested until the supply of clams and worms is exhausted, and then being left to lie fallow for years at a time until the system restores itself on its own, and the cycle picks up once again. But in the meantime, what are horseshoe crabs, flounders, shorebirds, and other mudflat residents going to eat?

Ecosystem-based management takes the entire bay into account in making its decisions, not just one species here and another there. If the whole isn't working for all of its members, it is broken

and not fully functional.

Scallops are another issue in Taunton Bay. Treated like clams and worms, they are heavily dragged and dive-harvested until there aren't any more, then the remaining few are left to recover on their own, if they can. Like other shellfish, scallops are filter-feeders that withdraw particles of food from passing currents, cleaning the water, increasing the penetration of sunlight to primary food producers. They are active participants in maintaining the water quality of the bay. With scallops now commercially extinct, who knows the effect that has on the ecosystem as a whole? One thing is certain: the bay is diminished by this reduction in biodiversity, and its waters are cloudier to boot.

Kelp beds in Taunton River are another resource that has had its ups and downs in recent years. *Urchin dragging* in the 1990s took out most of the kelp, but the dragging moratorium of 2005 (in effect until June 30, 2008) gave it a respite, the beds have been largely restored, and bass are in the river again. Kelp offers cover for fish that are preyed upon by diving birds such as cormorants, mergansers, and loons. It is also a primary producer that, unlike others in the bay, can thrive in swift currents, cold waters, and deep channels. Its holdfasts provide a specialized habitat for a variety of channel invertebrates. It is very much part of the productive and protective underpinning of Taunton Bay.

Harvesting *American eels* (called *elvers* in their juvenile stage) on their journey from the Sargasso Sea to local streams and ponds is another issue in Taunton Bay. The problem is that placement of the fyke nets used to catch them can remove the vast majority of young eels from the narrow entries to local streams, preventing them from ever growing and reproducing. The ox-bow in East Franklin is one crucial site. Nets on the outside of the turn can catch almost every eel swimming toward Card Mill Stream, just as two nets under the Route 200 bridge can do the same. Between them, nets in these places can decimate an age class of eels in short order.

At water's edge, *erosion* is a growing concern in Taunton Bay. With sea-level rise escalating as glaciers and ice sheets melt around the Earth, and oceans expand in response to warming temperatures, the pace of erosion is picking up, causing banks to slump, trees to fall, and soil to wash into the tide, where it becomes sediment swept along by winds and currents. Some degree of erosion is to be expected, but with sea level rising three times faster now than during the twentieth century, it is taking its toll of shorelines all around the bay, as well as increasing turbidity that blocks sunlight from penetrating to subtidal algae, phytoplankton, and other mainstays of the estuarine food web. This will diminish the bay's overall food *productivity*, with a cascading effect on all life that depends on that nourishment.

Buffers of native vegetation are another issue requiring improved management. As the Taunton Bay watershed becomes more highly developed, human land uses add to a greater collective source of pollution that will inevitably cause changes to the bay. Such claims are heard so often, it is hard not to become deaf to their warnings. More effective than media releases, door-to-door contact with residents throughout the watershed would literally and figuratively bring the message home. That can best be accomplished by volunteers who live in the watershed themselves. For fifteen years, Friends of Taunton Bay has mailed a homeowners handbook to new residents, with uncertain effect. Where managers could step in would be in working with

local towns and code enforcement officers to insure high levels of shoreland zoning compliance.

Buffers are one way to mitigate *pollution*, but they are only a partial solution to the overall issue. Other partial solutions apply to such areas as lawn care, gardening, landscaping, water conservation, septic system maintenance, environment-friendly household cleansers, waste disposal, pest control, and recycling. A particularly important consideration is site selection for houses, garages, outbuildings, parking lots, driveways, and septic fields. The best way to deal with pollution is to anticipate the danger so it can be dealt with during the planning stage of land use and development.

Recreational boating is another management issue in Taunton Bay. Use of kayaks, canoes, and small motorboats is on the rise, along with the potential for contact with wildlife. Here is another opportunity for public education in how to avoid too-close-for-comfort confrontations which can cause seals, gulls, loons, eagles, herons, and other native species to flee for their lives. A local resident recently observed a young boy stomping on a horseshoe crab while his family looked on. The more access the public has to wildlife, the more such incidents will occur among those who are unsure how to conduct themselves in the presence of unfamiliar species. Ecotourism is a plus for Maine, but it requires training, supervision, and management to ensure responsible behavior on the part of those who participate in it. There are two sides to the *access* issue held by those who want more of it for small boats, and those who are leery of placing increased pressure on wildlife. When the new Hancock-Sullivan Bridge replaced the former Singing Bridge in 2000, a boat ramp on the Sullivan side was removed, leaving only Carrying Place Inlet as a place where boats could be put in near high tide.

Which raises the issue of distributing *maps* that give specific locations of local hotspots and habitats which are vital to good management, but to nonprofessionals may serve as an invitation to go where no man ought to go. The area we visit for recreation is the same place where other wild species make their living. We are there for enjoyment, they are there to survive. As a result of The Taunton Bay Study, Friends of Taunton Bay now has maps showing harbor seal haulouts, eagle nests, horseshoe crab breeding habitats, among others giving a variety of ecological details about this particular bay. Those data, so readily published for public distribution, require some form of management themselves to minimize the danger of drawing untrained observers to the bay who may unintentionally disturb its wild resources.

Regarding the issue of *management scale*, one important learning from the Taunton Bay pilot project in bay management is that the bay itself may be too small to warrant establishing a unique comprehensive management plan dedicated to insuring its ecological sustainability, as well as the sustainability of the uses people make of it. For instance, commercial and recreational landings data are not available at this scale, making it impossible to know just how much biomass of a particular species is removed, data essential to effective ecosystem-based management. One option would be to make landings data of public-trust resources available to the public itself, which seems only fair to the larger public of Maine on whose behalf those resources are managed by the state. But if so-called proprietary interests prevail, whether rightly or wrongly, that will not happen anytime soon.

Regional coastal management (Part 1)

An alternative to bay-by-bay management would be to establish management bodies having authority for a region encompassing several bays varying in size and other characteristics. *Regional coastal management* was discussed by several panelists at the Bay Management Steering Committee work session in Belfast on February 17, 2006. It seemed to be an idea whose time had come. A coast-wide network of regional management bodies would allow management decisions to be made closer to local bays themselves, enabling greater participation by local stakeholders and groups in the decision-making process. Too, regional management bodies would rely on finer-grained information about local bays as supplied by local groups specifically concerned with those bays, and they would encourage “ownership” of regional decisions by those who participate in the management process, thus encouraging compliance with decisions reached in a regional setting. Local management plans would be approved by the regional body.

Who would pay for setting up and operating a regional management network along the coast? Given the rate at which public treasuries are being depleted at state and national levels, it would be best to acknowledge that the buck for funding such an enterprise begins and stops at the regional level, with matching funds coming from other sources if they are available. On state and federal levels, monies would be sought through CZMA and the state coastal program. Since the thrust of the network would be to manage coastal uses on a regional basis, it is fitting that coastal users themselves cover expenditures made on their behalf. Some effective form of coastal-use management is necessary, that is evident. Those users include everyone who uses land and facilities in a coastal watershed, everyone who uses the receiving coastal waters of such a watershed, and everyone who visits a coastal bay or watershed for any and all reasons. This sounds like a new tax on coastal activity, but it could also be seen as a permit or license fee covering a range of uses, all funds generated being dedicated to effective management of the uses that people make of the coast. Since inhabitants of and visitors to coastal watersheds use the coast in the course of their daily lives, what could be more equitable than supporting the costs those uses entail? Otherwise, we are taking something from the public domain for nothing, which is demonstrably unfair and unjust.

All of which points to a present need for *public education* regarding the ecological and economic impacts human uses have had and are having on the coast of Maine. Since this stretch of coast has long been part of native and settler experience, it is easy to take the coast for granted as always being available unchanged from its original state. That treats the coast as an ideal, a concept having eternal existence in the human mind. As an ecologically rich and sensitive area, however, the coast has a living minute-to-minute history, and is subject to appreciation, protection, and enjoyment, as well as misuse, depletion, destruction, and other forms of abuse. Many coastal organizations include both data collection and public education in their mission statements. Regional management efforts would help coordinate those separate programs, and provide assistance with volunteer recruitment, training, supervision, and sharing local data with stakeholders and the regional public.

SECTION B

Regional Management

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.

Aldo Leopold, "The Land Ethic," in *A Sand County Almanac*,
Oxford University Press, 1949

Marine Resource Management Policy Guidelines:

- [1] Manage the marine environment and its related resources to preserve and improve its ecological integrity and diversity of marine communities and habitats,
- [2] to expand our understanding of the productivity of the Gulf of Maine, and
- [3] to enhance the economic value of the State's renewable marine resources.

Maine's Coastal Management Policy Guidelines, December 1986
Policy No. 2, Marine Resource Management

The problem

Taunton Bay is the northern reach of Frenchman Bay. In both bays, scallops and sea urchins have been fished to commercial extinction through a combination of dragging and dive harvesting. In 2005, Ed Monat, (a scallop diver in Frenchman Bay for sixteen years until the resource was depleted) could find no location in the bay where he could bring up urchins to show children on his Dive-In Theater boating tours. Sea cucumbers are scarce in the area. And so are blue mussels, once one of the most common shellfish in the Gulf of Maine.

At the same time, housing development on coastal waterfronts and in coastal watersheds has been booming. Miles of roads and driveways have been put in every year, myriad septic systems installed on shallow soils, acres of lawns and impervious surfaces added to send runoff rushing for the nearest cove with an increased burden of pet wastes, fertilizers, herbicides, and insecticides.

The cumulative impact of land and water uses by coastal residents and visitors alike is altering the natural processes on which the integrity of coastal ecosystems have depended since the retreat of the last glacier. Of course change is to be expected in natural systems; nothing stays the same very long. So it is not surprising that we often hear it said that if we just wait a few years, things will be back where they were. In the meantime, more lots are sold, roads put in, new species fished to commercial extinction.

The solution

If single-species management, or single-use management hasn't worked, what about multi-use management? Can we step back far enough from our narrow focus to see the big picture? See how species depend on one another, relate to their habitats, and recover together from stressful events? That is, can we learn to see not only the tree we want to cut, but the forest that provides for and protects it? Settlers on St. Croix Island in 1604 cut every tree down, exposing themselves to the elements, effectively changing the climate, when they could have fit their habitation in with those trees and had a much easier time of it.

Can we learn to see that sustainable uses and jobs depend on sustainable resources and habitats? And in turn depend on the integrity of ecosystems that have managed themselves for thousands of years through checks and balances built into their structure?

A *source* is a place where you can get what you want. A *resource* is a source that replenishes itself again and again. *Sustainability* (or renewability) is at the heart of every resource. If a resource is driven to commercial extinction, demand has exceeded supply to the point that the resource is broken and cannot meet the demands placed upon it. Clearly, if our uses deplete resources beyond their point of recovery, our appetites are broken, too, in being excessive.

To prevent that from happening, we need to adjust what we take to the supply that is available while still being able to replenish itself. That is, so the resource remains a resource for the long-term, and the uses we make of it are sustainable, too. Developers and harvesters alike want the good times to roll. They can achieve that goal by both becoming stewards to assure the sustainability of the resources they use. A steward is a manager, a person who sees to it that the resources he depends on are in good order season after season, year after year.

Agency structure

The marine resource management policy quoted at the head of this report is grounded on an ecological understanding of sustainable natural systems throughout the Gulf of Maine. Given what is presently known, no rational policy could be based otherwise. The economic value of those systems to the people of Maine depends on their remaining renewable for the long term. That policy was right during Governor Brennan's administration, and is still right for the Baldacci administration today.

Other coastal management policies are still right, too. *Policy No. 3*: "Support shoreline management that . . . considers the cumulative effects of development on coastal resources." *Policy No. 5*: "Encourage and support cooperative State and municipal [or regional] management of coastal resources." *Policy No. 6*: "Protect and manage critical habitat and natural areas of State and national significance and maintain the scenic beauty and character of the coast even in areas where development occurs." And *Policy No. 8*: "Restore and maintain the quality of our fresh, marine and estuarine waters to allow for the broadest possible diversity of public and private uses."

Yet in the intervening years, coastal development has continued unabated, and coastal resources have been taxed beyond assured sustainability. Sprawl, pollution, and declining stocks and fisheries are in the news week after week. We still talk about the urchin industry, mussel industry, aquaculture industry, as if target species had an economic existence apart from the ecosystems that produce them. How could such fine sounding policies produce such disappointing results?

One reason is that traditional views and attitudes are slow to change. We become invested in our ways of doing business, and fail to see that those ways may be part of the problem. Too, we can easily become captives of our untested assumptions. Natural systems often do rebound after stressful events, but not always. Sometimes they can be pressed too hard, too often to recover. We often hear it said, "A man's gotta make a living," as if any living were justified at any cost to

the environment. Management policies are ideas in the mind. It is one thing to sign and date them, another altogether to translate them into changes in traditional behaviors. What policies can do is split reality into two worlds, one world inhabited by those who wrote them and cite them in their work, the other by those who ignore them and carry on as if they did not exist. Abruptly, regulators and practitioners don't see eye-to-eye, and tend to talk at cross-purposes. The inshore trawl survey is a case in point. Juvenile fish habitat sampling is another. Some see these as bold efforts to provide fisheries-relevant ecological data. Others as unwarranted meddling by the state in their affairs.

As it stands, state agencies have to speak two languages, a seemingly elitist policy language and the language of the common people whose behavior it is their mission to regulate. When these worlds collide, they produce anger and frustration on both sides. This friction can lead to a kind of class warfare between true believers in policy (who tend to understand the language of biology and ecology) and true believers in traditional practice (who tend to place more value on the language of experience). One of the goals of the current bay management pilot projects is to find ways to bridge the gap between those who make policies and those asked to put them into practice. At the Muscongus Bay Forum in Waldoboro on March 25, 2006, NOAA Coastal Management Fellow Vanessa Levesque summarized the aim of the pilot projects in a single question: "What is the role of community?" in managing coastal resources.

The state is open to suggestions regarding collaboration with local or regional interests toward the shared goal of more effective coastal management. Suddenly the possibility of local or regional management is opened up. Inviting another layer of bureaucracy perhaps, but one specifically meant to bridge the linguistic and experiential divide between managers and users, between policy and practice.

The solution would seem to lie in state agencies and regional groups working together so they can learn each other's language in order to add their understandings toward the common goal of improved coastal management. The prospect is that local knowledge and know-how will be combined with the state's ecological expertise so that ecosystem-based management will assure the sustainability of coastal ecosystems, habitats, communities, and populations of species regarded as resources, together with the sustainability of jobs dependent on those species, habitats, and ecosystems.

Coastal resources are products of complex living systems which are highly susceptible to inadvertent abuse. Not one of us means to disturb those bountiful systems, but being well-intended is no guarantee that our cumulative activities will do no harm. We aren't clever enough to manage coastal ecosystems themselves, so the job of natural resources management is to manage the users of such systems to assure that clean fresh and salt water, natural filtering processes, undisturbed riparian areas, marine and estuarine habitats, and ample stocks of the full diversity of native species will assure the sustainable health of the coast itself, and of the human communities along it from Kittery to Calais.

To bring that off, different state agencies managing coastal resources would have to get together to integrate the management of land and water resources which affect one another. And the agencies themselves would have to be realigned to enable ecosystem-based management to

replace single-use or industrial, single-species management. The true marine resource is not the individual species that seems to be at issue, but the ecosystems which produces those species as members of marine or estuarine communities in their associated habitats. Ecological understanding and appropriate uses would figure prominently in the missions and programs of such agencies, and not be tacked on to accord with politically correct policies that in practice are largely overlooked.

Fisheries stock assessments, for example, now focus on that sector of a single-species population within a particular location or jurisdiction. It is widely assumed that such stocks can be considered separately from the communities, habitats, and food webs—the ecological contexts in which they exist—as if they were self-sufficient entities unto themselves. Any agency structured to accommodate one-species-at-a-time thinking is at odds with the real-world settings in which such species exist in coastal waters. Managing cod by themselves led to the collapse of a fishery that depended on urchins and kelp beds as much as on a single species of fish.

Extending coastal management closer to the users of coastal resources will require structural adjustments at the top of the management hierarchy in state government. Ecosystem-based management in coastal watersheds and their receiving salt waters starts at the highest level of policymaking where fundamental assumptions prepare the way for practices implementing policies handed down from above. (*See Recommendation 2*)

Public-trust management

Who owns the coast and all its resources? Water, wildlife, and marine resources out to three miles from shore are owned by the people of Maine. They are managed as a public trust by the state and its agents. In the public interest, such resources are best maintained in viable condition. In some circles it is held that physical possession of a resource (a codfish, say, or Canada goose) transfers ownership from the people to him who has caught, shot, or trapped it. If that were true, the public trust would be vacated in very short order. As a variant of the possession argument, public trust management is sometimes taken to imply that coastal resources are in the public domain, available on a first-come, first-served basis. Again, if that were true, the domain would quickly become a hollow cornucopia, an empty horn of dreams.

Public trust management makes stewards of all coastal users on behalf of the public, those born and unborn. It bestows responsibility on each of us to monitor the effects of our uses, and if we won't do it ourselves, requires the state to do it for us. Which it will do through application of its vast array of regulatory devices such as permits, licenses, leases, easements, zoning, limits, rules, contracts, quotas, codes, laws, ordinances, etc. With the unfortunate result that by doing so, the state sets itself up as the seeming enemy of its own people, who would rather be left alone to regulate themselves. The answer to this dilemma is to conduct public trust management as close to the people on the local level as possible, so that as stewards they understand the need for restraint because they want the same resources they enjoy to be available undiminished in coming years, both to themselves and to their children.

Members of the Governance working Group of The Taunton Bay Study could not agree among themselves on the relative balance between transparency and confidentiality regarding particular uses of Maine's public trust resources. Some felt harvesters had proprietary interests that should

be protected as a matter of right, while others felt the public had a right to know how resources were being used on its behalf. Does shoreland development entail responsibility for guarding against the cumulative degradation of Maine's coast? If the Maine Constitution protects private property owners against takings without just compensation, what protection do citizens have against private withdrawals of their public trust resources? (*See Recommendation 3*)

Ecosystem-based management (Part 2)

Public trust doctrine leads directly to ecosystem-based management as a means of protecting the interests of the people of Maine. Coastal resources are not just for those who happen along today, but for those who will surely follow tomorrow and the day after. It is the integrity of the ecosystems on which a functioning coast depends that is held in trust by the state for the benefit of all citizens. Safeguarding that integrity is the goal of effective management, for habitats in coastal watersheds as well as those in bays, estuaries, and along stretches of open coast.

It is the nature of ecosystems to govern themselves, as is true of all natural systems. What, then, is the state's role in ecosystem-based management? It "focuses on managing human activities, rather than deliberately manipulating or managing entire ecosystems" (U.S. Commission on Ocean Policy, *Preliminary Report*, 2004, Chapter 3, page 6).

"Specifically," the report states, "ecosystem-based management:

- emphasizes the protection of ecosystem structure, functioning, and key processes;
- is place-based in focusing on a specific ecosystem and the range of activities affecting it;
- explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;
- acknowledges interconnectedness among systems, such as between air, land and sea; and
- integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependencies" (same source, page 1).

The Scientific Consensus Statement on Marine Ecosystem-based Management warns that managing individual user groups in an ecosystem context is insufficient to ensure the healthy functioning of the system as a whole without considering the cumulative impact of all user groups together (including fisheries, recreation, aquaculture, transportation, and shoreland development). "The long-term, integrated, cumulative impacts of all relevant sectors on an ecosystem must be evaluated, with a mechanism for adjusting impacts of individual sectors" (McLeod, K.L., et al. 2005). This requires collaboration between regional stakeholders and regulatory agencies on the state level.

Visualizing ecosystems as the machinery responsible for ongoing resource production, it becomes evident that every component must be maintained in smooth running condition if production is to be sustained at a high level year after year. Just as good carpenters sharpen and take care of their tools, users of coastal lands and waters are wise to become stewards of the ecological machinery that supports their respective uses. Since they generally can't observe those workings firsthand to know whether they are functioning properly or not, it is essential to establish monitoring programs up and down the coast to keep users up-to-date about the health and integrity of the ecosystems on which their various uses depend.

Such monitoring would include at least five dimensions of ecosystem functioning: 1) the plant and algal food producers (eelgrass, kelp, saltmarsh, rockweed, phytoplankton, etc.) that fix carbon in a form that marine animals can subsequently consume, 2) the higher levels of life (plant eaters, animal eaters, predators, decomposers) dependent on primary production, 3) marine and estuarine habitats, 4) communities of life within those habitats, and 5) the conditions and forces (weather, salinity, currents, nitrogen, pollution, turbidity, etc.) that control the working of marine systems. This is an example of the kinds of information at a local scale required to make ecosystem-based management truly effective. (*See Recommendation 4*)

Rich information

Marine and estuarine ecosystems carry on their work largely unobserved even by those who use local waters and shores. The past has shown that such systems cannot be taken for granted, or that their recovery, once disturbed, will take place in due course. If management decisions are to be appropriate to local waters and the watersheds draining into them, they must be based on sound observations and information rather than guesstimates or assumptions. If those decisions are to be truly relevant to particular waters, they need to be grounded on demonstrable facts. Anyone can have an opinion, but facts are earned through careful study by disciplined observers.

The best management decisions are based on the best (comprehensive, detailed, accurate) available data. Up till now, gathering data about coastal bays and drainage basins has been driven largely by issue-specific research not intended to gauge the functional integrity of entire ecosystems. But ecosystem-based management can work only if enough is known about particular systems to support decisions relevant to their continuing functioning, use, and sustainability.

Indicators selected for monitoring in The Taunton Bay Study.

ESF	SPC	TOX	PHY	WS	OTH
Eelgrass	Horseshoe Crabs, Hog Bay	Blue Mussel Assay	Weather (rain, wind, air T)	Buffers of Native Vegetation	Oyster Set
Mudflat Invertebrates	Horseshoe Crabs, Egypt Bay	Fecal Coliform Counts	Dissolved Oxygen	Septic Systems	Ecohistory Narrative
Clam Pots	Harbor Seals	Phytoplankton	Transparency		Invasive Species
Commercial Landings	Shorebird Count		Surface Temp.		
	Eagles		Bottom Temp.		
			Salinity		
			Bluff Erosion		
			Nitrogen		

Note: Data on indicators in shaded cells were not collected in 2005.

The Indicators Working Group of The Taunton Bay Study settled on a monitoring program comprising 25 indicators of the health and integrity of the bay ecosystem. These were grouped into six categories: 1) ecosystem structure & function (ESF), 2) species of special concern (SPC),

3) toxicology (TOX), 4) physical characteristics (PHY), 5) watershed functioning (WS), and 6) other information thought to be useful (OTH). (*See table above.*)

The Mapping Working Group created 25 maps presenting detailed information about Taunton Bay and its watershed (see mapping report for details). Many of these maps are based on local monitoring efforts (primary producers, drifter studies, horseshoe crab habitats) and these data are not yet available from any other source. Taken together, these maps and indicators are meant to support use-management decisions appropriate to the Taunton Bay ecosystem. (*See Recommendation 5*)

Shifting baselines (Part 2)

Wildlife inventories today in Maine list no woolly mammoths, mountain lions, gray wolves, caribou, Labrador ducks, great auks, passenger pigeons, Eskimo curlews, or any number of other species that would have been common at one time, but have since been extirpated or become extinct. What we find depends on when we look for it. Baseline studies are time sensitive. It follows that expectations based on such studies are time sensitive, too.

American bald eagle nesting sites on Taunton Bay provide a case in point. Breeding pairs are often loyal to particular sites, nesting in the same area (or even the same tree) for a decade or more. Then something happens—a mate dies, a nesting tree blows down, a road to the shore is put in—and the site is no longer utilized. But that does not necessarily mean it is no longer suitable eagle breeding habitat. Baseline surveys would rate the site differently, depending on whether an active nest was sighted or not. But such judgments are based on the knowledge and experience of the observer. High-value habitat? It depends on who is making the call, when the call is made, and the background of information against which this year's survey is interpreted.

Similarly, eelgrass in Taunton Bay has been shown to be highly variable in its spread and density. In a single year, 2001, 90% of the bay's eelgrass went missing for reasons that have not been determined. Several explanations have been proposed—herbicides in runoff, an algal bloom, strong winds, high turbidity, disease, depleted subaqueous soils, among others—but the true cause is a mystery. The upshot is that thousands of acres of subtidal flats remain potential eelgrass habitat, even though there is scant eelgrass on that acreage today.

In Mount Desert Narrows in upper Frenchman Bay, eelgrass has been bountiful within living memory, but in recent years has been largely depleted. Dieback may be one cause, wild mussel dragging another. Former eelgrass habitat is now being converted to mussel grow-out beds, ensuring that eelgrass will never recover as long as aquaculture leases remain active. What is the highest and best use of such natural habitat areas? What are the long-term consequences of converting wild subtidal areas to farms, as prairies in the Midwest were plowed into fields, promoting erosion, soil loss, and declining yields?

Baseline surveys are hugely important, but need to be placed against historical records, which are often scattered, providing a reason for the survey to be conducted in the first place. The situation is inherently contradictory, but you have to start somewhere. The danger in establishing baselines arbitrarily is in rushing to interpret the data in the absence of an appropriate historical context.

Ted Ames has shown that “lost” information regarding seasonal cod spawning and feeding grounds can be traced through historical records. The same is likely true for eelgrass beds, substrates, and other coastal habitats. (*See Recommendation 6*)

Integrated management

Fishermen frequently speak against the possibility that non-fishermen (“porch sitters,” “trophy-home owners”) might play a role in their affairs. This is understandable, but, given that the species fishermen are after are managed on behalf of the people—all the people—of Maine, neither realistic nor defensible. No one wants others meddling in his affairs, but when affairs overlap so that a zone of mutual interest is created, then it would be unjust to include one party while excluding another.

Interdisciplinary integration, as one of the common themes in worldwide coastal management derived from the CLF notebook, can be summarized as follows. “Successful coastal management plans generally contain a provision for encouraging broad stakeholder participation. Through integration, all governmental bodies, interest groups, stakeholders, and those with general public concerns are brought into the management process. This is done in two ways. Governmental agencies involved in some aspect of coastal management are joined under one procedure for managing coastal issues. Additionally, governing bodies are set up to allow all users of coastal areas to be included and given a say in the management process” (revised by S. Perrin for the Governance Working Group, March 28, 2005).

Not only are different agencies and stakeholders brought into the coastal decision-making process, but lines between traditional jurisdictions are not allowed to obscure the fact that receiving waters are directly affected by seemingly remote events in the basins feeding into them. Bays do not begin at their shorelines, but at the ridgelines bounding their respective watersheds. Streams, ponds, and wetlands all drain to salt water. Too, intertidal and shallow subtidal waters flow into deep water, and vice versa. Effective coastal management is not well served by drawing hard and fast lines on a map. Ecosystem boundaries are worthy of respect, but so are the flowing connections that tie one ecosystem to another. (*See Recommendation 7*)

Regional coastal management (Part 2)

As the pilot project in Taunton Bay unfolded, participants became increasingly aware that other bays faced many of the same issues that surfaced in Taunton Bay. In a real sense, the local estuary was a small slice of a much larger, regional pie. Barbara Arter's economic assessment showed that landings data were not available at so small a scale, preventing crucial information about the amount of biomass being withdrawn from the ecosystem to be determined. There is no way to manage use of an ecosystem if the extent to which it is being used and affected is a great big question mark.

Near the end of the project, meetings were held with other groups in Hancock County (*listed below*) to sound them out about collaborating in an intermediate level of coastal management between local communities and the state. Two main themes emerged from those meetings: 1) the need for coordination between regional groups, and 2) the need for a core of issues that would serve to unite such groups around their common (or complementary) concerns. At the prospect of some coastal management decisions being made closer to home, volunteer monitoring efforts

began to grow in importance, and the reality of local participation in regional management efforts became more likely than before. “Tapping skills and assets unique to local circumstances, with government perhaps in a supporting role, can empower the principals to work out a solution for themselves (Gary Gardner, 2005).

Maps of the Maine coast were produced to show possible ecological boundaries between regional management areas, and the stretch of coast between the Penobscot River and Gouldsboro Bay examined as a region that might hold together through alliances between groups and stakeholders with the same, similar, or complementary concerns. Participating organizations included Maine Coast Heritage Trust, Bar Harbor Marine Resource Committee, MDI Water Quality Coalition, Downeast Initiative, East Penobscot Bay Environmental Alliance, Friends of Taunton Bay, Friends of Blue Hill Bay, Bagaduce Watershed Association, Marine Environmental Research Institute, Frenchman Bay Conservancy, Frenchman Bay Fisheries, and College of the Atlantic.

A draft schematic diagram showing how a regional, ecosystem-based, cooperative state and local coastal management council might be organized was circulated. Two paid staff positions were suggested, that of a *regional coordinator* to bring and hold different groups and stakeholders together through mutual understanding and education, and of a *regional coastal steward* in charge of volunteer training, regional monitoring, and mapping. Regional towns would be represented, and regional schools and colleges would provide ecosystem understanding and expertise. Most importantly, the regional management council would bring state agency staffs together with regional coastal users in meetings chaired by the regional coordinator to hear evidence-based arguments on which binding regional management decisions could be based. Although the state would need to supply a template specifying a range of conditions which regional management councils would have to satisfy, allowance was made for the fact that regional decisions would be likely to vary along the coast, reflecting local knowledge, concerns, and conditions. (*See Recommendation 8*)

Regional enforcement

Interpretation and enforcement of coastal zone management provisions vary from town to town, from one code enforcement officer to another. Expansive views from picture windows often rank more highly with property developers than keeping pollution out of the bay. Shorefront property owners do not truly become stakeholders until they realize the connection between their actions and the view they so highly prize. There is a need for combined application of friendly persuasion, education, and uniform enforcement to help residents and seasonal visitors to develop awareness of the responsibilities entailed by coastal property ownership.

Regional management councils might well develop an educational role by holding meetings around watershed development issues such as maintaining effective buffers of native vegetation, maintaining septic systems, best practices of fertilizer and pesticide use, and keeping impervious surfaces to a minimum.

The Marine Patrol would enforce decisions made by regional management councils, which would be likely to vary from one region to another along the coast, as well as enforce rules and statutes which apply to all regions.

To encourage regional communities to celebrate their values and ties to the coast of Maine, residents should be given an opportunity to formulate a set of principles that would guide their respect for and use of the coast. This exercise would help coastal citizens develop awareness of issues, risks, and responsibilities associated with coastal living, and would predispose them to conduct their activities in light of this awareness. (*See Recommendation 9*)

Recommendations or decisions?

Are regional coastal management councils to make decisions, or merely recommend decisions to bodies with higher authority? Sally McCloskey of the East Penobscot Bay Environmental Alliance visualizes regional management being phased in over a number of years, starting by making recommendations only, its authority growing as it gathers judgment and experience. Probably not all regions are equally ready to develop management councils; it can be expected that one will be the first to move in this new direction, with others following (or not) as they see how those first steps turn out. CLF envisions regional decisions meeting statewide criteria.

Stakeholders are more apt to get involved if real issues are to be considered at the first meeting; and real issues are more apt to be brought up if real decisions need to be made. Learning, too, is more likely to happen in real life situations than during dry runs. It makes sense to have responsibility for scoping sessions, say, at the regional level, and some oversight of shoreland zoning enforcement early on, with responsibilities for aquaculture siting hearings and gear conflict resolution coming at a later stage. (*See Recommendation 10*)

Education

A big challenge facing regional coastal management is the need to start stakeholders thinking in ecological terms about their various uses of coastal habitats and ecosystems. We hear a lot about economic indicators, and indicators of climate change, global warming, and sea-level rise. When we go to the doctor, we are accustomed to having our vital signs read, which provide indications about how our bodily ecosystem is faring at the time. But where do we learn to think about the health and integrity of the bays and shores where we live? We hear about it if there's an oil spill, or a sewer line breaks, but generally speaking we are provided with little information about how well our bays and shores are functioning. Faced with this dearth of relevant information, we assume everything is going along fine until we hear otherwise.

Regional coastal managers would help fill this information void because they would insist on having current data about regional ecosystems on which to base decisions affecting all manner of coastal uses. As mentioned above, regional coastal management would serve an educational function in raising public awareness of coastal ecosystems, and of real and potential ways coastal communities can affect their functioning for good or ill.

The U.S. Commission on Ocean Policy *Preliminary Report* issued in April 2004 cites a 1999 study that “indicated that just 32 percent of the nation’s adults grasp simple environmental concepts, and even fewer understand more complex issues, such as ecosystem decline, loss of biodiversity, or watershed degradation (National Environmental Education & Training Foundation 1999 *National Report Card*)” (page 39). In our culture today, events affecting the economy are news, predictions of global environmental catastrophe are news, but the state of the local bay is not news. That is largely because we are not actively looking into what that state

might be. The presence of regional managers on the local scene will change that by ensuring that the health and integrity of the local coast is a matter of public knowledge and concern because it affects how people use that coast in their everyday lives. (*See Recommendation 11*)

Conflict resolution

When a conflict arose between two members of The Taunton Bay Study over commercial rockweed harvesting on a private island protected by a conservation easement held by the Maine Department of Inland Fisheries and Wildlife, no forum was available to aid the parties in resolving their differences. It is proposed here that the regional coastal management body would provide a forum with staff trained in handling such matters in a venue as close to the conflict site as possible. With a proactive planning process on the local level, conflicts might well be reduced.

The rockweed conflict illustrates the need for this forum since several avenues of resolution were explored, to no avail. A respected mediator was brought in; a list of alternative dispute resolution (ADR) resources was reviewed; a meeting with DMR and the State Office of Attorney General was proposed; the landowner consulted a regional land trust, MDIFW (holder of the easement), among others; the seaweed harvester consulted the Maine Seaweed Council; DMR exchanged e-mail message with both parties; a colleague offered help; and so on. All without success.

One idea that came out of this dispute was a proposed framework for conflict resolution based on guiding principles which the parties had previously agreed to. In the model proposed, the differences between User A and User B would be viewed in light of four questions: 1) What impact does each use have on the local ecosystem? 2) How are Maine citizens served by these uses? 3) Which use is the more ecologically sustainable? And 4) How do these uses affect other users and uses?

Another idea was based on Marshall Rosenberg's approach to non-violent communication by which each party reviews which of his/her basic needs are not being met, what needs the other party may have that are not being met, and then the participants in strife join in seeking clarity about how their respective needs can be met.

An outside source offered guidelines for conflict resolution: 1) identify the problem, 2) focus on the problem, 3) attack the problem, not the person, 4) listen with an open mind, 5) treat a person's feelings with respect, and 6) take responsibility for your actions. The same source said conflict resolution proceeds by a series of stages from 1) conversation, through 2) mediation, 3) arbitration, 4) litigation, and lastly to 5) legislation.

There is no shortage of irony in the parties' failure to resolve the conflict between them when they were both engaged in a project asked to propose to the state ways of resolving user conflicts in the area. The failure was instructional in demonstrating just how intractable such conflicts can be. As E.F. Schumacher has written, "The art of living is always to make a good thing out of a bad thing" (*A Guide for the Perplexed*, 1977). The good thing to come out of this conflict would be creation of a regional setting and procedure for conflict resolution available to all users of coastal lands and waters. (*See Recommendation 12*)

Volunteer workforce

How many regional volunteers does it take to screw-in a light bulb? Just one. To monitor phytoplankton once a week for an entire season? Again, just one. So, how many volunteers would it take to provide reliable data to a regional coastal management council for an entire year? Five? Twenty? Eighty? Volunteers are motivated to donate their personal time and skills to a cause they find worthy. The worthiness of the cause is their primary reward because it rubs off on them. The key to maintaining a volunteer workforce is to provide jobs, training, and supervision that make a difference in the real world. People want to be useful in supporting or promoting values they feel are important. How important is improved coastal management? In the abstract, not very. But in connection with a specific place on the coast that people feel connected to, and want to share with their families, that sense of place is closely allied to building the sort of community they themselves want to live in. It is one thing to monitor in a setting you don't care about; another entirely to do the same work in a place that you love. The difference is between scrubbing pots for a living, and scrubbing your own frying pan while looking out the kitchen window onto a vista you've seen a thousand times and find exciting each time you look. (*See Recommendation 13*)

Regional staffing

Two things have to happen to make regional coastal management work: people in the region must feel empowered to participate in a process that really matters to them, and the process must produce demonstrable results they approve of and support. Most of the monitoring in the region will be done by volunteers working for different organizations. But volunteer monitors require training, support, supervision, respect, and recognition. One key position in each coastal management region would be that of *coastal steward*, who is charged with volunteer recruitment, training, supervision, data collection and presentation, and charting/mapping of findings. That is a tall order for one person, but several of those duties could be performed centrally for several stakeholder groups at a time. Each coastal steward would need a central regional office to work in and from, equipped with phone, computer, projector, scanner, printer, mapping software, files, and training space doubling as workspace.

The other position would be that of *regional coordinator*, who is charged with coordinating stakeholder groups in the region, planning, publicity, coastal education, conflict clarification and resolution (both informal and formal), and chairing meetings of the regional management body. This is the person who knows what's going on along the coast, and can bring stakeholders together to make things (such as forums on particular topics, and coastal awareness events) happen in an orderly fashion. The coordinator would share the regional office with the coastal steward. (*See Recommendation 14.*)

Who pays?

Who pays for regional coastal management? One group is made up of the volunteers who devote a share of their life's energy to making it happen. Another is the paid staff that gets those volunteers together, trains them, coordinates their efforts, and shows them that their cumulative efforts have a positive influence in their communities. State agencies are underfunded for the responsibilities they bear now, how could they spread those responsibilities over eight coastal regions that don't yet exist? The answer lies partly in the access those regions would provide to a volunteer workforce willing to share the burden of ecosystem-based management without monetary compensation. Coastal organizations, too, would continue to pursue their respective

missions and raise their own funds. Startup money might be available from federal sources. But as stated above, the payment buck begins and ends with coastal users themselves.

State agencies would have to assume the added cost of sharing their duties with people on the regional scene. Once a month or so, staff would have to go to Machias, Ellsworth, Searsport, and other regional centers to participate in making regional coastal management serve the interests of the people of Maine. By sharing management responsibilities with regional stakeholders, some portion of the total management budget could be slimmed down accordingly. Public meetings can be held in regional schools, churches, town halls, and similar low cost facilities.

If there are to be, say, eight regions, each with office space, equipment, and a permanent staff of three (regional coordinator, regional steward, and regional office manager), that would add considerable cost to the coastal management effort, no matter how many new volunteers present themselves. Could an equivalent twenty-four positions be eliminated in Augusta? The answer to that is clearly no, but central staff reduction might be possible to some extent. With authority partially devolving from the state to the regional level, there would be a concurrent shift in the need for staff support from Augusta to regional centers along the coast. Adding a new level of management does not have to increase management costs inordinately. With hearings held nearby, regional volunteers would have more of an incentive to get involved in the decision-making process by attending meetings and providing good monitoring data at minimal cost.

Even with agency streamlining for ecosystem-based and regional management, the fact remains that additional costs will be incurred, which would most properly be borne by coastal users themselves. In Maine, such users are abundant, including residents and visitors alike in every coastal watershed. Since every activity in those watersheds has an impact on coastal waters to some degree, a good case can be built for those benefitting from the coast having to pay the cost of managing those impacts up front as a consequence of living where they have chosen to live, and adopting lifestyles suited to those locations. Since everyone in Maine lives in a watershed that ultimately drains to the coast, the set of all coastal users would include the entire population of the state, and their visitors. It is appropriate for pond, stream, river, and wetland users to be fiscally accountable as well as, say, residents of coastal towns.

It makes sense for Maine to apply a coastal user fee to all purchases affecting the coast. One approach would be to apply that fee to marine and recreational items, home construction, road use, and other activities directly impacting coastal waters. Another approach would be to identify uses having no impact on the coast, and exempting them from the fee. But every activity and every purchase has a more-or-less direct impact on coastal waters. Even having a baby (all those disposable diapers and loads of laundry), going to a theater (driving, consuming popcorn and sodas, using a public toilet), or watching a video or TV program at home (using electricity, eating and drinking) and other seemingly non-coastal activities do, in fact, have coastal ramifications.

By way of an example, a 0.025% (0.00025) tax on all sales in the state could provide roughly \$5 million annually as a wholly appropriate means of raising funds dedicated to improved management of Maine's coastal regions, and the rivers that run through them. That could provide \$625,000 a year for each of eight coastal regions. (*See Recommendation 15*)

Coordination & alliances

One benefit of regional coastal management is likely to be the incentive it would provide regional organizations to coordinate efforts with one another to leverage the effectiveness of their respective activities. Different organizations would see the advantage of partnering to find common cause in preserving the quality of fresh and saltwater, or terrestrial and marine ecosystems that are not as separable as they appear to be on a map.

For Friends of Taunton Bay, it makes sense to affiliate with Frenchman Bay Conservancy, the local land trust, and Mount Desert Island Water Quality Coalition, which is concerned with phytoplankton monitoring, beach pollution and cruise ship monitoring, among many other programs. The Union River Watershed Coalition brings an assortment of groups to the table for discussions of common concerns regarding the river that drains most of interior Hancock County.

Too, The Bagaduce River and Taunton Bay, both shallow embayment estuaries, are sufficiently similar to suggest an alliance between Friends of Taunton Bay and the Bagaduce Watershed Alliance to share experiences and advance their mutual interests. There are several schools and colleges in the area that could play key roles in such an alliance: College of the Atlantic in Bar Harbor, Maine Maritime Academy in Castine, University of Maine Center in Ellsworth, as well as high and middle schools throughout the region could aid in integrating coastal concerns and understanding. The National Park Service Schoodic Education & Research Center (SERC) in Winter Harbor might well play a similar coordinating function, as could the Hancock County University of Maine Extension Office and Hancock County Planning Commission north of Ellsworth, and both the University of Maine Center for Cooperative Aquaculture Research and the USDA Cold Water Aquaculture Research Station on the shore of Taunton Bay in Franklin. Other regional groups include the East Penobscot Bay Alliance in Deer Isle, Penobscot East Resource Center in Stonington, Friends of Blue Hill Bay in Blue Hill, Friends of Morgan Bay in Surry, and MDI Biological Laboratory in Bar Harbor.

Fisheries groups active in the region include the Downeast Initiative, Zone C Lobster Council, Great Eastern Mussel Company, Frenchman Bay Fisheries, among several others. (*See Recommendation 16*)

Regional management template

To encourage regional participation, the state must provide a flexible format within which effective coastal management can emerge with different emphases in different regions along the coast. This is similar to requiring towns to adopt comprehensive plans while allowing those plans to represent the interests and concerns of townspeople themselves. What the state lays out would be a cluster of provisions each region must fulfill in its own way. All provisions would be united by a concern for the long-term sustainability of both coastal ecosystems and jobs. Within such a framework, regions would have latitude in fulfilling the various provisions by means thought to work best for them, as long as they met standards set by the state.

An early phase of regional coastal management planning would be devoted to selecting management issues that could appropriately be dealt with on a regional basis. This would require deliberation among state agencies, regional groups, towns, developers, and coastal users of all sorts. The State Planning Office would be an appropriate lead agency for this phase of the work,

with other agencies, towns, and regional groups following-through in working out the details.

Some of the template provisions that might be considered could include regional permitting; aquaculture scoping sessions, siting criteria, monitoring requirements; conflict resolution; gear restrictions; no-take areas; habitat mapping; shellfish ordinances; monitoring programs; data storage, reliability, confidentiality; enforcement; public education; volunteer recruitment, training, and supervision; among others.

State-level administration of regional management councils would not properly fall to one particular agency, but would center in a collaborative body representing all agencies with coastal management concerns and responsibilities. This body would review applications from the different coastal regions for regional management responsibilities, and would review regional recommendations and decisions. It would play an important role in designing the template guiding each region in crafting its own coastal management program. (*See Recommendation 17*)

Principles

“At the onset of any study, it is useful to identify the principles that will provide the underlying foundation for the work, particularly as a way to articulate for all interested parties the defining parameters that will provide guidance for the study as it develops” (Bay Management Study: Statement of Study Principles. Approved by the LWRC, September 29, 2004).

Members of the Governance Working Group of The Taunton Bay Study met 16 times in various configurations between February 4, 2005, and April 14, 2006, discussing principles of coastal management at almost every meeting. The following four principles, together with their corollaries as agreed to on March 23rd, 2006, are the distillation of those fifteen months of work.



Principles of Coastal Use Management

Stakeholders who subscribe up-front to a set of principles such as these are predisposed to contribute to and support management decisions.

1. Public Trust: The coastal marine resources of Maine are held in trust by the State. Therefore, the primary coastal management goal is to sustain those resources for the long-term benefit of all citizens.

- Local users and managers are stewards on behalf of Maine citizens
- Use of public trust resources in the coastal management area is dependent on responsible actions by all users

2. Ecosystem-based Management: In contrast to single-use (or single-species) management, ecosystem-based management considers the effects of all uses on ecosystem structure and function in a given place, and on relationships between system components over time. It is not ecosystems themselves that are managed, but human behavior.

- Management decisions support the long-term sustainability of natural systems and processes

- Decisions regarding any facet of the system are recognized as affecting the whole system
- Management is both adaptive and proactive
- The economic and social vitality of human communities is considered in management decisions

3. Information-rich Management: Management decisions are informed by a broad range of both historical and up-to-date information provided by monitoring, research, and personal observation.

- Ecosystems are monitored and described scientifically
- Data are augmented by local experience and observations
- Trends are incorporated into management decisions
- Confidentiality of proprietary information required for management decisions is protected
- The processes by which such information is used are in the public record

4. Integrated Land-and-Water-Use Management: Streams, runoff, and seepage carry land-use products from a watershed into marine waters, linking the land to the sea. Coastal use management recognizes that connection, and provides a cooperative means of bringing the knowledge and responsibilities of state, regional, and local offices to bear on coastal uses and issues.

- Within state jurisdiction (out to three miles), management is coordinated throughout the subtidal marine environment, the intertidal environment, immediate coastlands, and interior coastlands to the extent of the watershed
- Management is collaborative among stakeholders and municipalities, state agencies, and federal agencies

Based on drafts of August 31, 2005, October 5, 2005, March 1, 2006; approved March 23, 2006.
(See Recommendation 19)



The unthinkable

One difficulty in proposing measures such as regional coastal management flows from the common assumption that all other variables will stay the same as they are today, which we all know isn't true. When time comes to enact whatever legislative changes the Bay Management Steering Committee and Land and Water Resource Council recommend, the state budget will be in worse or better shape, the political climate will be more or less stable, gasoline will cost more or less than \$4.00 a gallon, global warming will be or not be a matter of common concern, hurricanes will be or not be recurrent along the Maine coast, red tides will close down shellfish beds on an annual or occasional basis, the Iraq war will still or not be going on, and so forth. The climate of future times cannot be known in advance. As is true of coastal ecosystems, too many factors impinge on them to allow even an educated guess regarding their future state of health and integrity.

Given that such uncertainty is likely to persist, the only sensible course is to build allowance for a range of changing circumstances into whatever bills are ultimately to be brought before the

Legislature. Adaptive management is at the heart of these several recommendations. Effective coastal management adapts to the current and anticipated state of ecosystems which are always in process of becoming other than they were or are now. Vigilance is one key to regional coastal management, along with a rapid-response capability for dealing as effectively as possible with changing situations along the coast. (*See Recommendation 19*)



SECTION C

Draft Recommendations

The following draft recommendations are also the work of Steve Perrin. They are offered here to generate discussion about ways to implement the coastal management principles approved by the full Governance Working Group on March 23, 2006 on a regional basis.

An attempt was made to rank the recommendations according to their 1) place in an implementation timeline, 2) relative importance, and 3) degree of challenge or difficulty. With few exceptions, many received similar rankings in needing early attention, being highly important, and posing, for a variety of reasons, equal challenges. The ranking scheme was abandoned as a tool intended to establish a useful scale of priorities.

Recommendation 1: Any subsequent template guiding the development and spread of regional coastal management in Maine will provide a background of representative coastal management efforts from Maine and around the world to stimulate local thinking.

Recommendation 2: For ecosystem-based management to be successful on the coast, state agencies will undergo appropriate restructuring to support that approach. Agencies will adopt ecosystem-based thinking from the start in order for that thinking to spread via statutes and rules to coastal users themselves. Ecosystem-based management cannot be tacked onto a single-species management structure.

Recommendation 3: The State of Maine will issue clear guidance concerning the ownership (and hence stewardship) of coastal ecosystems, habitats, and the species they produce and support. Further, the state will specify the terms and conditions under which public trust resources can be taken for private profit.

Recommendation 4: To implement ecosystem-based management, the state will be clear that marine and estuarine ecosystems are self-regulatory by nature under a wide range of conditions, and that the function of management efforts is to insure ecosystem production remains undiminished so uses and jobs dependent on that production will be, as far as possible, sustainable for the long term.

Recommendation 5: To support ecosystem-based coastal management, a feedback loop will be established by which qualified researchers and trained local volunteers monitor the health and integrity of their coastal regions in order that coastal management decisions are based on the best available and most current information.

Recommendation 6: To become meaningful, rich monitoring data will be placed in the context of history. Since much of the data to be collected in support of regional coastal management lack historical depth, decision-makers must try to recreate an ecological record by promoting searches through journals, logs, newspaper accounts, and other documents pertaining to the natural history of the different coastal regions.

Recommendation 7: Integrated coastal management (ICM) is made a reality in Maine to ensure an exchange of information between all parties concerned with sustainable coastal uses and their effective management. This will integrate management efforts in coastal watersheds, estuaries, and marine waters within state jurisdiction, and involve town, regional, state, and federal agency and NGO personnel.

Recommendation 8: The Bay Management Steering Committee will propose a statewide network of ecologically-defined regions to implement regional coastal management in Maine. This network will be based on consideration of ecological characteristics, population density, use intensity, regional identity, and institutional resources, where appropriate.

Recommendation 9: One important aspect of regional coastal management will be to engage coastal residents and visitors in an ongoing exchange to raise citizen awareness of coastal issues and concerns. This heightened engagement and awareness will incline coastal users to abide by regional management decisions intended to ensure sustainability of coastal activities.

Recommendation 10: To allow for a steep learning curve, regional coastal management bodies will follow a graded path of management responsibility, moving as rapidly as possible from recommending regional management decisions to actually making such decisions in their own right. Meeting monthly or 10 times a year, these bodies will quickly garner sufficient experience to rise to their full management potential as allowed by the state. This phased assumption of responsibility allows regional groups to become proficient in gathering accurate coastal information relevant to the decision-making process.

Recommendation 11: The regional coastal management staff (coordinator, steward, and office manager) will share responsibility for educating the public of all ages concerning coastal issues related to sustainability, stewardship, and ecosystem-based management.

Recommendation 12: The template for regional coastal management bodies will include provisions for resolution of conflicts between users of coastal lands and waters. Such provisions will employ evidence-based presentations pertaining to ecosystem information, sustainability, and stewardship of public-trust resources.

Recommendation 13: Regional coastal management is not another layer of regulation laid on the people; it is an opportunity for the people to become involved in managing their own affairs in the places they care most about. To reach that goal, the state will share some of its regulatory authority by inviting coastal users to take part in managing allowable uses of regional land and water ecosystems.

Recommendation 14: Each coastal management region will be staffed with a qualified regional coordinator, regional coastal steward, and regional office manager.

Recommendation 15: State planners will apply for startup funds from the National Oceanographic and Atmospheric Administration (NOAA) to cover a three-year planning and implementing phase of the proposed regional coastal management program in Maine. During that period, sustaining funds will be sought from a combination of state, regional, county, and municipal entities, as well as other public and private sources.

Recommendation 16: To ensure long-term stability, regional coastal management will encourage participation of members from a broad range of incorporated coastal groups, each with its own bylaws and mission statement. For individuals to have representation on a regional management body, they will be advised to join a group having or establishing such representation.

Recommendation 17: Working with regional towns and nonprofit groups, state agency personnel will design the coastal management template setting forth the various areas of decision-making or recommendation-making authority to be assumed by regional coastal management councils along the coast.

Recommendation 18: The Taunton Bay pilot project proposes that this set of four guiding principles, or some variation thereof, be included in a regional coastal management template to be developed to facilitate development of a uniform yet flexible capacity for regional-level management along the Maine coast.

Recommendation 19: In delegating a portion of its authority to regional coastal management bodies, the state will encourage and empower those bodies to be fast and flexible in adapting to changes affecting regional habitats, ecosystems, and the uses people make of them.



References

Bigelow Laboratory for Ocean Sciences, 1985. *Maine's Intertidal Habitats: A Planner's Handbook*. Maine State Planning Office, November 1985.

Conservation Law Foundation, 2004. "Classic Elements of Coastal Management." Revised as "Common Themes in Worldwide Coastal Management" by Steve Perrin, March 28, 2005, for the Governance Working Group, The Taunton Bay Study.

- Gardner, Gary, 2005. "Yours, Mine, Ours—Or Nobody's?" Groundwork, *World•Watch*, March/April 2005.
- Fefer, Stewart I., and Patricia A. Schettig, 1980. *An Ecological Characterization of Coastal Maine (North and East of Cape Elizabeth)*. Chapter 5: The Estuarine System, pages 5-1–5-148. U.S. Fish and Wildlife Service/OBS-80/29, October 1980.
- Hart, Tracy, [2003]. *Needs and Issues in the Taunton Bay Region. A Survey of Residents from Franklin, Hancock, and Sullivan, Maine*. Maine Sea Grant Program, University of Maine, Orono, Maine.
- Jones, Jody, 1986. *The Cumulative Impacts of Development in Southern Maine: Important Wildlife Habitats*. Maine State Planning Office, November 1986.
- Kelley, Joseph T., Alice R. Kelley, and Orrin H. Pilkey Sr., 1989. *Living with the coast of Maine*. Sponsored by the National Audubon society. Durham and London: Duke University Press, 1989.
- Macinko, Seth, & Daniel W. Bromley, 2004. "Property and Fisheries for the Twenty-First Century: Seeking Coherence from Legal and Economic Doctrine." *Vermont Law Review*, Vol. 28:623–621.
- Maine State Planning Office, 1986. *Coastal Management Policy Guidelines*. Coastal Advisory Committee, December 1986.
- Maine State Planning Office, 1998. *The Estuary Book*. Maine Coastal Program. Revised edition. Originally published January 1991.
- McLeod, K.L., J. Lubchenco, S.R. Palumbi, and A.A. Rosenberg, 2005. Scientific Consensus Statement on Marine Ecosystem-Based Management. Signed by 217 academic scientists and policy experts with relevant expertise. Communication Partnership for Science and the Sea (COMPASS).
- Moore, Slade, 2004. *The Taunton Bay Assessment*. A Report to the Maine Legislature Marine Resources Committee for Consideration of the 2000–2005 Dragging Prohibition. Maine Department of Marine Resources, January 30, 2004.
- Peterson, M. Nils, Markus J. Peterson, and Tarla Rai Peterson, 2005. "Conservation and the Myth of Consensus." *Conservation Biology*, Pages 762–767, Volume 19, No. 5, June 2005.
- Pew Oceans Commission, 2002. *Managing Marine Fisheries in the United States*. Proceedings of the Pew Oceans Commission Workshop on Marine Fishery Management. Seattle, Washington, 18–19 July, 2001. Pew Oceans Commission, Arlington, Virginia.

- Steneck, Robert S., John Vavrinec, and Amanda V. Leland, 2004. "Accelerating Trophic-level Dysfunction in Kelp Forest Ecosystems of the Western North Atlantic." *Ecosystems* (2004) 7: 323–332.
- U.S. Commission on Ocean Policy, 2004. *Preliminary Report*. Chapter 3: Setting the Nation's Sights, pages 31–39. Chapter 9: Managing Coasts and their Watersheds, pages 107–116.
- Wells, Peter G., 2003. "Assessing health of the Bay of Fundy—concepts and framework." *Marine Pollution Bulletin* 46 (2003) 1059–1077.
- Wells, P.G., G.R. Daborn, J.A. Percy, J. Harvey, and S.J. Rolston, 2004. *Health of the Bay of Fundy: Assessing Key Issues*. Proceedings of the 5th Bay of Fundy Science Workshop and Coastal Forum, "Taking the Pulse of the Bay." Environment Canada, Atlantic Region. Occasional Report No. 21. March 2004.

